Appendix F

Glossary

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A

Acre-Foot (AF) — A unit commonly used for measuring the volume of water; equal to the quantity of water required to cover one acre (43,560 square feet or 4,047 square meters) to a depth of 1 foot (0.30 meter) and equal to 43,560 cubic feet (1,234 cubic meters), or 325,851 gallons. (An acre-foot of water is considered enough water to meet the needs of two families of four for a year.)

Action Level — The level of a contaminant in drinking water that is considered not to pose a significant health risk to people ingesting that water on a daily basis. Action Levels (ALs) are health-based advisory levels established by DHS for chemicals in drinking water that lack *Maximum Contaminant Levels (MCLs)*.

Activated Sludge Process — A treatment process that removes (by biological assimilation and decomposition) organic matter from wastewater using a biologic floc in an aerobic environment.

Advanced Treatment — Additional treatment provided to remove suspended and dissolved substances after conventional secondary treatment. Often this term is used to mean additional treatment after tertiary filtration and disinfection treatment for the purpose of further removing contaminants of public health or other water quality concern. This may include membrane filtration and advanced oxidation.

Agricultural Drainage — (1) the process of directing excess water away from root zones by natural or artificial means, such as by using a system of drains placed below ground surface level; also called subsurface drainage; (2) the water drained away from irrigated farmland.

Air Gap — An open vertical gap or empty space that separates a drinking water supply to be protected from another water system in a treatment plant or other location. The open gap protects the drinking water from contamination by *backflow*.

Aquifer — A geologic formation that stores water and yields significant quantities of water to wells or springs.

Arid — A term describing a climate or region in which precipitation is so deficient in quantity or occurs so infrequently that intensive agricultural production is not possible without irrigation.

Artificial Recharge — (1) the addition of surface water to a groundwater reservoir by human activity, such as putting surface water into a Spreading Basin. (2) The designed (as per human activities as opposed to the natural or incidental) replenishment of ground water storage from surface water supplies such as irrigation or induced infiltration from streams or wells.

B

Backflow — (1) The backing up of water through a conduit or channel in the direction opposite to normal flow. (2) The undesirable flow of water from a plumbing system back into the community potable water supply. (3) A reverse flow condition created by a difference in water pressures that causes water to flow back into the distribution pipes of a drinking water supply from any source other than the intended one. Backflow prevention assemblies prevent contamination and are required by city and state laws. Also referred to as back *s*iphonage.

Backflow Preventer — A device that allows liquids to flow in only one direction in a pipe. Backflow preventers are used on sewer pipes to prevent a reverse flow during flooding situations. They are also used at connections to drinking water systems to prevent potentially contaminated water from flowing into drinking water supplies. One type of Backflow Preventer is a *Check Valve*.

Bacteria (Singular: Bacterium) — (1) Microscopic one-celled organisms, which live everywhere and perform a variety of functions. While decomposing organic matter in water, bacteria can greatly reduce the amount of oxygen in the water. They also can make water unsafe to drink. (2) Microscopic unicellular organisms, typically spherical, rod-like, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials, for example, decomposing organic matter into a form available for reuse by plants. Some forms of bacteria are used to stabilize organic wastes in wastewater treatment plants, oil spills, or other pollutants. Disease-causing forms of bacteria are termed "pathogenic." Some forms of bacteria harmful to humans include:

[1] ***Total Coliform Bacteria*** – A particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas formation within 48 hours at 3 C. In the laboratory these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35 C plus or minus 1.0 C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as numbers of colonies per 100 milliliter (mL) of sample.

[2] ***Fecal Coliform Bacteria*** – Bacteria that are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all the organisms that produce blue colonies within 24 hours when incubated at 44.5 C plus or minus 0.2 C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as numbers of colonies per 100 mL of sample.

[3] ***Fecal Streptococcal Bacteria*** – Bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms that produce colonies which produce red or pink colonies within 24 hours at 35 C plus or minus 1.0 C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as numbers of colonies per 100 mL of sample.

Beneficial Use (of Water) — A use of water resulting in appreciable gain or benefit to the user, consistent with state law, which varies from one state to another. In California, beneficial uses of waters of the state that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves. (Water Code, Section 13050(f))

Best Management Practices (BMP) — (1) A generally accepted practice for some aspect of natural resources management to protect or achieve the best use of the resources, such as water conservation measures, drainage management measures, or erosion control measures. Typically incorporates conservation criteria. (2) A set of field activities that provide the most effective means for reducing pollution from a nonpoint source.

Biochemical Oxidation — The process by which bacteria and other microorganisms feed on complex organic materials and decompose them. Self-purification of waterways and activated sludge and trickling filter wastewater treatment processes depend on this principle.

Biochemical Oxygen Demand (BOD) — (1) A measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria. (2) A measure of the amount of oxygen removed from aquatic environments by aerobic micro-organisms for their metabolic requirements. Measurement of BOD is used to determine the level of organic pollution of a stream or lake. The greater the BOD, the greater the degree of water pollution. Also referred to as *Biological Oxygen Demand (BOD)*.

Biochemical Oxygen Demand (BOD) Loading —The BOD content, commonly expressed in pounds/day, of wastewater passing into a waste treatment system or a body of water. The greater the BOD content, the greater the degree of pollution.

Biodegradation — The metabolic breakdown of materials into simpler components by living organisms. A more specific form of biotransformation.

Biofouling — The gradual accumulation of waterborne organisms (as bacteria and protozoa) on the surfaces of engineering structures in water that contributes to corrosion of the structures and to a decrease in the efficiency of moving parts. Biofouling contributes also to the clogging of membranes and filters.

Biogas — Methane gas produced during the anaerobic decomposition of the remains of plants or animal wastes by bacteria.

Biological Oxidation — Decomposition of complex organic materials by microorganisms. Occurs in the selfpurification of water bodies and in activated sludge wastewater treatment processes.

Biological Oxygen Demand (BOD) — (1) The amount of oxygen required to stabilize decomposable matter by aerobic action. (2) An indirect measure of the concentration of biologically degradable material present in organic wastes. It usually reflects the amount of oxygen consumed in five days by biological processes breaking down organic waste. Also see *BOD5*. Also referred to as *Biochemical Oxygen Demand (BOD)*.

Biological Wastewater Treatment — The use of bacteria to degrade and decompose organic materials in wastewater.

Biosolids — A nutrient-rich organic material that is a byproduct or waste resulting from the treatment of wastewater. Biosolids contain nitrogen and phosphorus along with other supplementary nutrients in smaller doses, such as potassium, sulfur, magnesium, calcium, copper and zinc. Soil that is lacking in these substances can be reclaimed with biosolids use. The application of biosolids to land improves soil properties and plant productivity, and reduces dependence on inorganic fertilizers. The terms biosolids, *Sludge*, and Sewage Sludge can be used interchangeably.

Blackwater — Water that contains animal, human, or food wastes; wastewater from toilet, latrine, and agua privy flushing and sinks used for food preparation. Compare to *Graywater*.

Blending — The mixing or combination of one water source with another, typically a finished source of water with raw water to reuse water while still satisfying water quality standards, for example, mixing of product water from a desalting plant with conventional water to obtain a desired dissolved solids content, or mixing brine effluents with sewage treatment plant effluents in order to reduce evaporation pond size.

BOD — See *Biochemical Oxygen Demand* (*Biological Oxygen Demand*).

BOD5 — The amount of dissolved oxygen consumed in five days by biological processes breaking down organic matter. This is the common standard of measurement of BOD. Also see *Biological Oxygen Demand (BOD)*.

Brackish Water — Water containing dissolved minerals in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses but that are less than sea water. Typically, water containing from 1,000 to 10,000 mg/L of dissolved solids.

C

Carbon Filtration —The passage of treated wastewater or domestic water supplies through activated charcoal to remove low concentrations of dissolved chemicals.

Carcinogen — A cancer-causing substance or agent.

Carcinogenic — Cancer causing.

CFS (Cubic Foot per Second) — A unit of measurement of flowing liquid equal to a rate of one cubic foot per second past a given section. A rate of flow equivalent to 448.83 gallons per minute. Also called Second-Foot. Also written as C.F.S. and cfs.

Check Valve — A type of *Backflow Preventer*.

Chemical Oxygen Demand (COD) — (1) A measure of the chemically oxidizable material in water, which provides an approximation of the amount of organic and inorganic oxygen reducing material present. The determined value may correlate with *Biochemical Oxygen Demand (BOD)* or with carbonaceous organic pollution from sewage or industrial wastes. Nonbiodegradable and recalcitrant (slowly degrading) compounds, which are not detected by the test for BOD, are included in this measurement.

Chlorination — The application of chlorine or one of its compounds to water or wastewater, often for disinfection or oxidation purposes.

Chlorine Residual — The concentration of chlorine remaining in water or wastewater at the end of a specified contact period that will react chemically and biologically. May be present as either combined or free chlorine, or both.

Clarification — A process or combination of processes where the primary purpose is to reduce the concentration of suspended matter in a liquid.

Clarifier — A device or tank in which wastewater is held to allow the settling of particulate matter.

Coagulant — (1) An agent that causes a liquid or solid to coagulate. (2) A chemical compound, such as Alum (aluminum sulfate), used to produce coagulation.

Coagulation — The process of destabilization and initial aggregation of colloidal and finely divided suspended matter by the addition of a floc-forming chemical (coagulant) or by biological processes.

Coliform (Bacteria) — A group of bacteria (Colon bacilli) predominantly inhabiting the intestines of humans or animals but also found in soil. While typically harmless themselves, coliform bacteria are commonly used as indicators of the possible presence of pathogenic organisms or fecal material. Generally reported as colonies per 100 milliliters (mL) of sample.

Coliform Index — An index of the bacteriological quality of water, based on a count of the numbers of coliform bacteria.

Collector Sewers — Pipes used to collect and carry wastewater from individual sources to an interceptor sewer that will carry it to a treatment facility.

Community — Public at large including, but not limited to, local ethnic groups, political/social/economic groups, environmental justice advocates and environmentalists.

Composite Sample —A representative water or wastewater sample made up of individual smaller samples taken at periodic intervals.

Constituents — Any of the chemical substances found in water. Typically, measurements of such constituents in sampled drinking water may consist of *Total Dissolved Solids (TDS)*, Hardness (concentrations of Calcium and Magnesium, specifically), Sodium, Potassium, Sulfate, Chloride, Nitrate, Alkalinity, Bicarbonate, Carbonate, Fluoride, Arsenic, Iron, Manganese, Copper, Zinc, Barium, Boron, and Silica.

Contact Recreation (Water) — Recreational activities involving a significant risk of ingestion of water, including wading by children, swimming, water skiing, diving and surfing.

Contaminant — (1) In a broad sense any physical, chemical, biological, or radiological substance or matter in the environment. (2) In more restricted usage, a substance in water of public health or welfare concern. Also, an

undesirable substance not normally present, or an unusually high concentration of a naturally occurring substance, in water, soil, or other environmental medium.

Contamination (Water) — Impairment of the quality of water sources by sewage, industrial waste, or other matters to a degree that creates a hazard to public health. Also, the degradation of the natural quality of water as a result of human activities. There is no implication of any specific limits because the degree of permissible contamination depends upon the intended end use, or uses, of the water.

Controlled Reuse — The use of recycled water under legal and physical control or restraint even though the recycled water may be co-mingled with water in a natural water body.

Cooling Tower — A large tower or stack that is used for cooling water by falling water being cooled by upward-flowing air and by evaporation of water. The cooled water is collected at the bottom of the tower and may be used again or discharged. A small amount of water is lost (consumed) through evaporation in this process.

Cooling Water — Water used for cooling purposes by electric generators, steam condensers, large machinery or products at industrial plants, and nuclear reactors. Water used for cooling purposes can be fresh, recycled, or saline water and may be used only once or recirculated multiple times. Also see *Cooling Tower*.

Cross-Connection — A physical connection between two water systems, typically between a potable water system and any source or system of water or other substance that is not approved for drinking.

D

Desalting (or Desalination) — A process to reduce the salt concentration of sea water or brackish water.

Detention Time — (1) The theoretical calculated time required for a small amount of water to pass through a tank at a given rate of flow. (2) The actual time that a small amount of water is in a settling basin, flocculating basin, or rapid-mix chamber. (3) In storage reservoirs, the length of time water will be held before being used.

Digester —In a *Wastewater Treatment Plant*, a closed tank that decreases the volume of and stabilizes raw *biosolids* or *sludge* by bacterial action.

Digester Gas — The gas produced as a result of the microbial decomposition of particulate organic matter under anaerobic conditions. Methane and hydrogen are major components.

Digestion —The biochemical decomposition of organic matter, resulting in partial gasification, liquefaction, and mineralization of pollutants. In wastewater treatment, the biological decomposition of organic matter in sludge. See *Digester*.

Dilution — The reduction of the concentration of a substance in air or water by mixing with additional air or water.

Direct Reuse — The use of recycled water that has been transported from a wastewater treatment plant to a reuse site without passing through a natural body of either surface or ground water.

Discharge — (1) The volume of water (or more broadly, the volume of fluid including solid- and dissolved-phase material) that passes a given point in a given period of time. (2) The flow of water from an opening into another body of water, as the release of treated wastewater from a treatment plant into a stream or the ocean. The flow of surface water in a stream or the flow of groundwater from a spring, ditch, or flowing artesian well. (3) (Hydraulics) The rate of flow, especially fluid flow; the volume of fluid passing a point per unit time, commonly expressed as cubic feet per second, million gallons per day, gallons per minute, or cubic meters per second.

Discharge Period — The period of time during which effluent is discharged or allowed to be discharged.

Discharge Permit — A permit issued by the state to discharge effluent into waters of the state.

Discharge Point — A location at which effluent is released into a receiving stream or body of water.

Disinfection —The process of killing a large portion of microorganisms in or on a substance, but not bacterial spores. The primary objective of disinfection in water and wastewater treatment is to kill or render harmless microbiological organisms that cause disease. *Chlorination* is the most prevalent disinfection option However, other viable disinfection processes include ozonation and ultraviolet radiation (UV).

Disinfection By-Products — (1) Chemicals that are formed when a disinfectant such as chlorine is added to water that contains organic matter, usually from decaying plant or animal material. (2) Compounds that form when chlorine combines with naturally occurring or pollution-derived organic, carbon-based materials, such as the acids from soils or decaying vegetation and bromide (salt). Some of such by-products are suspected to be human *Carcinogens*. One typical such disinfection by-product for which the U.S. Environmental Protection Agency (EPA) has established *Maximum Contaminant Levels (MCLs)* as part of its enforcement of the *Safe Drinking Water Act (SDWA)* are total Trihalomethanes (TTHMs).

Dissolved Organic Carbon (DOC) — A measure of the organic compounds that are dissolved in water. In the analytical test for DOC, a water sample is first filtered to remove particulate material, and the organic compounds that pass through the filter are chemically converted to carbon dioxide, which is then measured to compute the amount of organic material dissolved in the water.

Dissolved Oxygen (DO) — (1) Concentration of oxygen dissolved in water and readily available to fish and other aquatic organisms. (2) The amount of free (not chemically combined) oxygen dissolved in water, wastewater, or other liquid, usually expressed in milligrams per liter, parts per million, or percent of saturation. The content of water in equilibrium with air is a function of atmospheric pressure, temperature, and dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved solids, with small temperature changes having the more significant offset. Photosynthesis and respiration may cause diurnal variations in dissolved-oxygen concentration in water from some streams. Adequate concentrations of dissolved oxygen are necessary for the life of fish and other aquatic organisms and the prevention of offensive odors. Dissolved oxygen levels are considered the most important and commonly employed measurement of water quality and indicator of a water body's ability to support desirable aquatic life. The ideal dissolved oxygen level for fish is between 7 and 9 milligrams per liter (mg/L); most fish cannot survive at levels below 3 mg/L of dissolved oxygen. Secondary and advanced wastewater treatment techniques are generally designed to ensure adequate dissolved oxygen in waste-receiving waters.

Dissolved Solids — (1) Minerals, chemical compounds, and organic mater dissolved in water. They form the residue that remains after evaporation and drying. Excessive amounts of dissolved solids make water unfit to drink or use in industrial processes.

DO — See *Dissolved Oxygen (DO)*.

DOC — See *Dissolved Organic Carbon (DOC)*.

Domestic Sewage — Wastewater and solid waste that is characteristic of the flow from toilets, sinks, showers, and tubs in a household. Also referred to as domestic waste.

Domestic Wastewater Facility — Refers to those facilities that receive or dispose of wastewater derived principally from residential dwellings, business or commercial buildings, institutions, and the like. May also include some wastewater derived from industrial facilities. Also referred to as *Municipal Wastewater Facility*.

Downstream — Any point beyond a reference point in the direction of the current of a stream.

Drinking Water — Water that does not contain objectionable pollution, contamination, minerals, or infective agents and is considered satisfactory for domestic consumption (drinking). The term is used synonymously with *Potable Water* and refers to water that meets federal drinking water standards of the *Safe Drinking Water Act [SDWA] (Public Law 93–523)* as well as state and local water quality standards and is considered safe for human consumption. Freshwater that exceeds established standards for chloride content and dissolved solids limits is often referred to as slightly saline, brackish, or nonpotable water and is either diluted with fresher water or treated through a desalination process to meet drinking-water standards for public supply.

Drinking Water Standards — Drinking water standards established by state agencies and the U.S. Environmental Protection Agency (EPA) for drinking water.

Drinking Water Supply — Water provided for use in households. The most common sources are from surface supplies (rivers, lakes, and reservoirs) or subsurface supplies (aquifers). The distribution of water to households is regulated under the *Safe Drinking Water Act (SDWA)* of 1974, as amended, as well as State regulations.

Drought — Hydrologic conditions during a defined period when rainfall and runoff are much less than average.

Dual-Distribution Piping (or Dual Plumbing)— The plumbing of a facility to provide two sources of water in separate piping systems, for example, a water distribution system that uses one set of pipes for the distribution of potable water and a separate set for the distribution of *Reclaimed Water*.

E

E. Coli (Escherichia Coli) — A bacterial species which inhabits the intestinal tract of man and other warm-blooded animals. Although it poses no threat to human health, its presence in drinking water does indicate the potential presence of other, more dangerous bacteria. Also see *Bacteria*.

Economic Analysis — The procedure to determine the total monetary costs and benefits of all the resources committed to a project regardless of who in the society contributes them or who in the society receives the benefits.

Ecosystem Restoration — Actions taken to modify an ecosystem for the purpose of re-establishing and maintaining desired ecological structures and processes.

Effluent — Wastewater or other liquid, treated or in its natural state, flowing from a treatment plant or process.

Effluent Limitation — An amount or concentration of a water pollutant that can be legally discharged into a water body by a point source, expressed as the maximum daily discharge, the maximum discharge per amount of product, and/or the concentration limit in the wastewater stream, as a 24–hour or 30–day average.

Endocrine Disrupting Compounds (EDCs) — Chemicals that can interfere with the normal hormone function in humans and animals, controlling metabolism, growth and reproduction

Environmental Justice (EJ) — The fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation and enforcement of environmental laws and policies or the planning and implementation of projects that affect the environment.

Environmental Water — The water for wetlands, the instream flow for a major river that is based on the largest flow specified in an entire reach of that river for maintenance of fish or, for wild and scenic rivers, the amount of water based on unimpaired natural flow. Also referred to as dedicated natural flows.

F

Feedwater —Water input into a desalting or water treatment plant or an industrial water-using facility.

Filtration — A process in which suspended matter is removed from a liquid through a medium which is permeable to the liquid but not to the suspended material. The medium may be sand or a human-made filter. The objective is often to remove particles that contain *Pathogens*.

Flow Augmentation — The addition of water to a stream especially to meet instream flow needs.

Fresh Water — Water that is not brackish or saline and is obtained from rainwater, surface waters such as lakes and streams, and groundwater.

G

Giardia Lamblia — A flagellate protozoan that causes the severe gastrointestinal illness giardiasis when it contaminates drinking water.

GPD — Gallons per day, a measure of the rate of flow or the rate of water withdrawal from a well. Typically used when the rate of flow in cubic feet per second (cfs) is too low to be useful.

Graywater (Gray Water or Greywater) — Wastewater from a household or small commercial establishment that does not include water from a toilet, kitchen sink, dishwasher, or water used for washing diapers.

Groundwater — Water that occurs beneath the land surface and fills the pore spaces of the alluvium, soil, or rock formation in which it is situated.

Groundwater Basin — A groundwater reservoir, defined by an overlying land surface and the underlying aquifers that contain water stored in the reservoir. In some cases, the boundaries of successively deeper aquifers may differ and make it difficult to define the limits of the basin.

Groundwater Overdraft — The condition of a groundwater basin in which the amount of water withdrawn by pumping exceeds the amount of water that recharges the basin over a period of years during which water supply conditions approximate average conditions.

Groundwater Recharge — The natural or artificial infiltration of surface water or injection of water into the zone of saturation (i.e., into groundwater aquifer).

Groundwater Table — The upper surface of the zone of saturation in an unconfined aquifer.

H

Hydraulic Barrier — A barrier developed in an estuary by release of fresh water from upstream reservoirs to prevent intrusion of seawater into the body of fresh water. Also, a barrier created by injecting fresh or recycled water to control seawater intrusion in an aquifer, or created by water injection to control migration of contaminants in an aquifer.

I

Impoundment — A natural or artificial collection or storage of water, as a pond, reservoir, pit, dugout, or sump confined by a dam, dike, floodgate or other barrier. An impoundment may be used to collect and store water for future use or may function as an aesthetic feature in a landscape.

Incidental Reuse — Unplanned use of treated wastewater *effluent* after disposal.

Incidental Runoff — Unintended, but perhaps unavoidable, runoff of water from a site where water is used, such as overspray from sprinkler irrigation.

Influent — Water, wastewater, or other liquid flowing into a reservoir, basin, or treatment plant.

Indirect Reuse — The use of reclaimed water indirectly after it has passed through a natural body of water after discharge from a wastewater treatment plant.

Issue area — As used in this report, a cluster of similar issues into a broader issue area to facilitate the analysis by workgroups of the Recycled Water Task Force and for organization of issues in the discussion in this report.

K

Key Recommendation — Recommendation addressing an issue of high priority to the Task Force.

L

Land Application — The reuse of reclaimed water or the utilization or disposal of effluents on, above, or into the surface of the ground through spray fields or other methods.

Landscape Impoundment — A body of water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include contact recreation.

M

Maximum Contaminant Level (MCL) — The highest drinking water contaminant concentration allowed under federal and State Safe Drinking Water Act regulations.

Municipal Discharge — The discharge of effluent from wastewater treatment plants which receive wastewater from households, commercial establishment, and industries. Wastewater from combined sewers carrying both wastewater and collected stormwater is included in this category.

Municipal Sewage — Sewage (mostly liquid) originating from a community, which is composed of domestic sewage and possibly commercial and industrial wastewater.

Municipal Wastewater Facility — A facility that receives and treats wastewater derived principally from residential dwellings, business or commercial buildings, institutions, and the like. May also include some wastewater derived from industrial facilities. Also referred to as *Domestic Wastewater Facility*.

N

National Pollutant Discharge Elimination System (NPDES) — The program established by the federal Clean Water Act (CWA) that requires all point sources of pollution discharging into any "waters of the United States" to obtain a permit issued by the U.S. Environmental Protection Agency (EPA) or a state agency authorized by the federal agency. The NPDES permit lists permissible discharges and/or the level of cleanup technology required for wastewater.

New Water — The water yield from a new water project or water management action that provides a net augmentation of supply to the State.

Non-Contact Cooling Water — Water used for cooling that does not come into direct contact with any raw material, product, byproduct, or waste.

Non-Contact Recreation — Recreational pursuits not involving a significant risk of water ingestion, including fishing, commercial and recreational boating, and limited body contact incidental to shoreline activity.

Nonpotable Water — Water that is not suitable for drinking because it contains pollutants, contaminants, minerals, or infective agents.

NPDES — See *National Pollutant Discharge Elimination System (NPDES)*.

NPDES Permit — A permit issued under the *National Pollutant Discharge Elimination System (NPDES)* for discharging pollutants directly into the waters of the United States.

O

Overdraft — see *Groundwater Overdraft*.

Outfall — The place where a sewer, drain, or stream discharges; the outlet or structure leaving a treatment plant through which reclaimed water or treated effluent is finally discharged to a receiving water body.

P

Particle Count —Results of a microscopic examination of treated water with a special "particle counter" that classifies suspended particles by number and size.

Pathogen — A disease-producing agent; usually referring to a living organism (i.e., biological). Generally, any viruses, bacteria, or fungi that cause disease.

Planned Reuse — The deliberate *direct* or *indirect* use of recycled water without relinquishing control over the water during its delivery.

Pollution — An alteration of the quality of waters of the State by wastes to a degree which unreasonably affects: (1) such waters for beneficial use or (2) facilities which serve such beneficial uses. Pollution may include *contamination*.

Potable Water — Water that is drinkable. Specifically, freshwater that generally meets the standards in quality as established in the U.S. Environmental Protection Agency (EPA) Drinking Water Standards for drinking water throughout the United States. Potable water is considered safe for human consumption and is often referred to as Drinking Water.

Primary Wastewater Treatment —The removal of particulate materials from domestic wastewater, usually done by allowing the solid materials to settle as a result of gravity. Typically, the first major stage of treatment encountered by domestic wastewater as it enters a treatment facility. The wastewater is allowed to stand in large tanks, termed *Clarifiers* or Primary Settling Tanks. Primary treatment plants generally remove 25 to 35 percent of the *Biological Oxygen Demand (BOD)* and 45 to 65 percent of the total suspended matter. Also, any process used for the decomposition, stabilization, or disposal of sludge produced by settling. The water from which solids have been removed is then subjected to *Secondary Wastewater Treatment* and possibly *Tertiary Wastewater Treatment*.

Purification (Water) — Steps taken to eliminate impurities and pollution from water.

R

Reclaimed Water or Reclaimed Wastewater – See *Recycled Water*.

Recycled Water or Reclaimed Water — Wastewater that is suitable for a beneficial use as a result of treatment. The degree of treatment provided for recycled water depends on the quality of water needed for the specific beneficial use and for public health protection and may include effluent from *Primary Wastewater Treatment*, *Secondary Wastewater Treatment*, *Tertiary Wastewater Treatment*, or *Advanced Treatment*.

Replenishment — The act of replenishing an aquifer, usually through artificial recharge, to offset excess groundwater pumping.

Repurified Water — As this term has been used in California, repurified water means recycled water that is used to augment water supplies by discharging advanced treated recycled water into a surface water reservoir that supplies water directly to a water treatment facility for a water supply system that serves domestic uses, including human ingestion. Typically, such waters would undergo extensive *Tertiary and Advanced Wastewater Treatment,* be stored in a reservoir for a specified minimum time (for example, one year), be blended with fresh water within the reservoir, then undergo further treatment and disinfection through a conventional surface water treatment plant before being distributed in the potable distribution system.

Reservoir (Water) — A pond, lake, or basin, either natural or artificial, for the storage, regulation, and control of water.

Reuse — The additional use of previously used water. As used in this report, it means the use of recycled water (wastewater that has been treated for beneficial use at a wastewater treatment plant).

Reverse Osmosis (RO) — A method to remove salts and other constituents from water by forcing water through membranes.

Riparian — Pertaining to the banks of a river, stream, waterway, or other, typically, flowing body of water as well as to plant and animal communities along such bodies of water. This term is also commonly used for other bodies of water, e.g., ponds and lakes.

Runoff — The volume of surface flow from an area.

S

Safe Drinking Water Act [SDWA] (Public Law 93–523) — A federal law, which is an amendment to the *Public Health Service Act* which established primary and secondary quality standards for drinking water. The SDWA was passed in 1976 to protect public health by establishing uniform drinking water standards for the nation. In 1986 SDWA Amendments were passed that mandated the U.S. Environmental Protection Agency (EPA) to establish standards for 83 drinking water contaminants by 1992 and identify an additional 25 contaminants for regulation every 3 years thereafter.

Salinity — (1) The concentration of dissolved salts in water or soil water. Salinity may be expressed in terms of a concentration or as an electrical conductivity. When describing salinity influenced by seawater, salinity often refers to the concentration of chlorides in the water. (2) The relative concentration of salts, usually sodium chloride, in a given water sample. It is usually expressed in terms of the number of parts per thousand (‰) or parts per million (ppm) of chloride (Cl). Although the measurement takes into account all of the dissolved salts, sodium chloride (NaCl) normally constitutes the primary salt being measured. Salinity can harm many plants, causing leaves to scorch and turn yellow and stunting plant growth. As a reference, the salinity of seawater is approximately 35‰ or 35,000 ppm. Also see *Total Dissolved Solids*.

Salt Sink — A body of water too salty for most freshwater uses.

Salt-Water or Seawater Intrusion — The invasion of a body of fresh water by a body of salt water. This usually occurs due to a hydraulic gradient resulting from a higher water surface elevation or higher water pressure in the salt-water zone than in the fresh water zone. It can occur either in surface or groundwater bodies. The term is applied to the flooding of freshwater marshes by seawater, the migration of seawater up rivers and navigation channels, and the movement of seawater into freshwater aquifers along coastal regions.

Secondary Wastewater Treatment — Treatment (following *Primary Wastewater Treatment*) involving the biological process of reducing suspended, colloidal, and dissolved organic matter in effluent from primary treatment systems and which generally removes 80 to 95 percent of the *Biochemical Oxygen Demand (BOD)* and suspended matter. Secondary wastewater treatment may be accomplished by biological or chemical-physical methods. Activated sludge and trickling filters are two of the most common means of secondary treatment. It is accomplished by bringing together waste, bacteria, and oxygen in trickling filters or in the activated sludge process. This treatment removes floating and settleable solids and about 90 percent of the oxygen-demanding substances and suspended solids. Disinfection is usually the final stage of secondary treatment. Also see *Primary Treatment* and *Tertiary Wastewater Treatment*.

Sewage — The spent water of a community, now usually referred to as *Wastewater* but it has the further implication of wastewater containing domestic waste.

Shutdown Test — A test to determine whether there is a *Cross-Connection* between a potable water system and a water system that is not approved for drinking water, such as a recycled water system. The test consists of alternately shutting off pressure from the potable water system and the nonpotable water system and detecting loss of pressure in the pressurized system, which might indicate a cross-connection.

Sludge — (1) Semisolid material such as the type precipitated by a *Wastewater Treatment Plant*. The terms *Biosolids*, sludge, and sewage sludge can be used interchangeably. (2) Mud, mire, or ooze covering the ground or forming a deposit, as on a riverbed. (3) Finely broken or half-formed ice on a body of water, especially the sea.

Stakeholders — Individuals and organizations who are involved in or may be affected by a proposed action, such as construction and operation of a water recycling project.

Suspended Solids (SS) — Solids that either float on the surface of, or are in suspension in, water, wastewater, or other liquid and which can be largely removed by laboratory filtering. Such suspended solids usually contribute directly to turbidity. Defined in waste management, these are small particles of solid pollutants that resist separation from the wastewater. Suspended solids (along with *Biochemical Oxygen Demand — BOD*) is a measurement of water quality and an indicator of treatment plant efficiency.

T

TDS (Total Dissolved Solids) — All the solids (usually mineral salts) that are dissolved in water. Used to evaluate water quality.

Tertiary Wastewater Treatment — Biological, physical, and chemical treatment processes that follow *Secondary Wastewater Treatment*.The most common *Tertiary Wastewater Treatment* process consists of flocculation basins, clarifiers, filters, and disinfection processes. The term Tertiary (Wastewater) Treatment is also used to include *Advanced Treatment* beyond filters.

Total Coliform — The *Escherica coli* and similar gram negative bacteria that are normal inhabitants of fecal discharges and soils. The total coliform group is recognized in the drinking water standards of public health criteria.

Total Coliform Bacteria — A particular group of bacteria that is used as an indicator of possible sewage pollution. This group includes coliforms that inhabit the intestine of warm-blooded animals and those that inhabit soils. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas formation within 48 hours at 35 degrees centigrade. In the laboratory, these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35 degrees centigrade plus or minus 1 degree centigrade on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as the number of colonies per 100 mL of sample.

Total Dissolved Solids (TDS) —A measure of the amount of material dissolved in water (mostly inorganic salts). Typically aggregates of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, etc. of calcium, magnesium, manganese, sodium, potassium, and other cations that form salts. The inorganic salts are measured by filtering a water sample to remove any suspended particulate material, evaporating the water, and weighing the solids that remain. An important use of the measure involves the examination of the quality of drinking water. Water that has a high content of inorganic material frequently has taste problems and/or water hardness problems. As an example, water that contains an excessive amount of dissolved salt (sodium chloride) is not suitable for drinking. High TDS solutions have the capability of changing the chemical nature of water. High TDS concentrations exert varying degrees of osmotic pressures and often become lethal to the biological inhabitants of an aquatic environment. The common and synonymously used term for TDS is “salt”. Usually expressed in milligrams per liter.

Total Maximum Daily Load (TMDL) —The maximum quantity of a particular water pollutant that can be discharged into a body of water without violating a water quality standard. The amount of pollutant is set by the U.S. Environmental Protection Agency (EPA) when it determines that existing, technology-based effluent standards on the water pollution sources in the area will not achieve one or more ambient water quality standards. The process results in the allocation of the TMDL to the various point sources of pollutants in the area.

Total Organic Carbon (TOC) — A measure of organic matter, which contains carbon, in water. Because many organic (carbon containing) compounds can be detrimental to human health, the measurement of TOC is a useful indicator of the quality of recycled water.

Treated (Wastewater) Effluent — Water that has received primary, secondary, or advanced treatment to reduce its pollution or health hazards and is subsequently released from a wastewater facility after treatment.

Treatment — Any method, technique, or process designed to remove solids and/or pollutants from water or wastewater. Also see *Primary Wastewater Treatment*, *Secondary Wastewater Treatment*, and *Tertiary Wastewater Treatment*.

Treatment Plant — A structure built to treat water or wastewater before using the water, discharging wastewater into the environment, or reusing the treated wastewater (*Recycled Water*).

Turbidity — (1) A measure of the reduced transparency of water due to suspended material. The term "turbid" is applied to waters containing suspended matter that interferes with the passage of light through the water or in which visual depth is restricted. The turbidity may be caused by a wide variety of suspended materials, such as clay, silt, finely divided organic and inorganic matter, soluble colored organic compounds, plankton and other microscopic organisms and similar substances. Turbidity in water has public health implications due to the possibilities of pathogenic bacteria encased in the particles and thus escaping disinfection processes. Turbidity interferes with water treatment (filtration), and affects aquatic life. Excessive amounts of turbidity also make water aesthetically objectionable. The degree of the turbidity of water is measured by a turbidimeter. (2) The collective optical properties of a water sample that cause light to be scattered and absorbed rather than transmitted in straight lines; the higher the intensity of scattered light, the higher the turbidity. Turbidity is expressed in nephelometric turbidity units (NTU) or Formazin turbidity units (FTU) depending on the method and equipment used.

U

Unplanned Reuse — Unplanned use of treated wastewater *effluent* after disposal. Also called *Incidental Reuse*. Many communities already unintentionally practice such unplanned reuse by withdrawing water from rivers containing treated wastewater discharged upstream.

Upstream — From a reference point in the direction toward the source or upper part of a stream; against the current. In relation to water rights, the term refers to water uses or locations that affect water quality or quantity of downstream water uses or locations.

V

Virus — The smallest (10–300 µm in diameter) life form capable of producing infection or diseases in man or other larger species. Complex macromolecules which are able to reproduce themselves only in living cells and are capable of producing infection and diseases.

W

Wastewater — (1) A combination of liquid and water-carried pollutants from homes, businesses, industries, or farms; a mixture of water and dissolved or suspended solids. (2) That water for which, because of quality, quantity, or time of occurrence, disposal is more economical than use at the time and point of its occurrence. Wastewater to one user may be a desirable supply to the same or another user at a different location. Also referred to as Domestic Wastewater or *Sewage* if it contains domestic waste.

Wastewater Reclamation — The planned reuse of waste water for specific beneficial purposes.

Wastewater Treatment — Any of the mechanical or chemical processes used to modify the quality of waste water in order to make it more compatible or acceptable to humans and the environment.

Wastewater Treatment Plant — A *Treatment Plant* containing a series of tanks, screens, filters and other mechanical, biological, and chemical processes by which pollutants are removed from wastewater. Less frequently referred to as *Waste Treatment Plant*.

Water Purveyor — Anyone who sells water to the public, usually the owner of a public water supply system; a public utility, mutual water company, county water district, or municipality that delivers water to customers.

Water Quality — (1) A term used to describe the chemical, physical, and biological characteristics of water, usually in respect to its suitability for a particular purpose, such as beneficial use or discharge to the environment.

Water Reclamation — (1) The treatment of water of impaired quality, including brackish water and seawater, to produce a water of suitable quality for the intended use. (2) A term synonymous to *Water Recycling*.

Water Recycling — (1) The process of treating wastewater for beneficial use, storing and distributing recycled water, and the actual use of recycled water. (2) The reuse of water through the same series of processes, pipes, or vessels more than once by one user, wherein the effluent from one use is captured and redirected back into the same use or directed to another use within the same facility of the user. This form of recycling, often without treatment between uses, is common in industrial facilities, such as cooling towers.

Water Softener — A pressurized water treatment device in which hard water is passed through a bed of cation exchange media for the purpose of exchanging calcium and magnesium ions for sodium or potassium ions, thus producing a softened water that is more desirable for laundering, bathing, and dishwashing.

Water Transfers — Marketing arrangements that can include the permanent sale of a water right by the water right holder; a lease of the right to use water from the water right holder; the sale or lease of a contractual right to water supply.

Wetland — An area that is periodically inundated or saturated by surface or groundwater on an annual or seasonal basis, that displays hydric soils, and that typically supports or is capable of supporting hydrophytic vegetation.

Z

Zero Discharge — The goal, in the preamble to the federal Clean Water Act (CWA), of zero pollutants in water discharges.

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